ABSTRACT OF THE DISCLOSURE

An interlayer insulating film composed of an organic compound film containing an organic component as a main constituent is deposited on a semiconductor substrate. Then, etching is performed with respect to the interlayer insulating film by using a plasma derived from an etching gas containing an ammonia gas as a main constituent. As a result, active hydrogen is generated in the plasma derived from the ammonia gas to decompose the organic component into hydrogen cyanide, whereby etching proceeds. Since a surface of the organic compound film is efficiently nitrided by nitrogen generated from the ammonia gas, the sidewalls of a depressed portion in the organic compound film are protected so that an excellent anisotropic property is provided. Since the etching gas does not contain a component which oxidizes the organic compound film, the problem does not occur that a gas is generated from the organic compound film in a subsequent heat treatment process.